

## CLAIMS

I Claim:

1           1. A heating device within an integrated circuit, comprising:  
2           a first conductive lead;  
3           a second conductive lead;  
4           a third conductive lead;  
5           a first resistive region connected between the first conductive lead and the  
6 third conductive lead; and,  
7           a second resistive region connected between the second conductive lead  
8 and the third conductive lead;  
9           wherein a side formed by the first conductive lead and the first resistive  
10 region is parallel to a side formed by the second conductive lead and the second  
11 resistive region.

1           2. A heating device as in claim 1 wherein an insulator is placed between  
2 the side formed by the first conductive lead and the first resistive region and the  
3 side formed by the second conductive lead and the second resistive region.

1           3. A heating device as in claim 1 wherein an insulator is placed between  
2 the first conductive lead and the second conductive lead, and wherein a third  
3 resistive region is placed between the first resistive region and the second  
4 resistive region, and wherein resistivity of the third resistive region is higher  
5 than resistivity of the first resistive region and of the second resistive region.

1           4. A heating device as in claim 1:

2           wherein an insulator is placed between the side formed by the first  
3       conductive lead and the first resistive region and the side formed by the second  
4       conductive lead and the second resistive region, except for an area immediately  
5       adjacent to the third conductive lead where a third resistive region separates the  
6       first resistive region and the second resistive region; and,

7           wherein resistivity of the third resistive region is identical to resistivity  
8       of the first resistive region and of the second resistive region.

1           5. A heating device as in claim 1:

2           wherein an insulator is placed between the first conductive lead and the  
3       second conductive lead;

4           wherein a third resistive region is placed between the first resistive  
5       region and the second resistive region, except for an area immediately adjacent  
6       to the third conductive lead where a fourth resistive region separates the first  
7       resistive region and the second resistive region;

8           wherein resistivity of the third resistive region is higher than resistivity  
9       of the first resistive region and of the second resistive region; and,

10          wherein resistivity of the fourth resistive region is identical to resistivity  
11       of the first resistive region and of the second resistive region.

1           6. A heating device as in claim 1:

2            wherein an insulator is placed between the side formed by the first  
3     conductive lead and the first resistive region and the side formed by the second  
4     conductive lead and the second resistive region, except for a plurality of areas  
5     where third resistive regions separate the first resistive region and the second  
6     resistive region; and,

7            wherein resistivity of the third resistive regions is identical to resistivity  
8     of the first resistive region and of the second resistive region.

1            7. A heating device as in claim 1:

2            wherein an insulator is placed between the side formed by the first  
3     conductive lead and the first resistive region and the side formed by the second  
4     conductive lead and the second resistive region, except for a plurality of areas  
5     where third resistive regions separate the first resistive region and the second  
6     resistive region; and,

7            wherein resistivity of the third resistive regions is higher than resistivity  
8     of the first resistive region and of the second resistive region.

1            8. A heating device as in claim 1 wherein the integrated circuit is  
2     connected to a planar light circuit.

1            9. A heating device as in claim 1 wherein the integrated circuit is used  
2     within an inkjet printhead.

1           10. A heating device comprising:

2           a first region formed from bottom layer of resistive material;

3           a second region and a third region formed from the middle layer of  
4 resistive material; and,

5           fourth region and a fifth region formed from a top layer of conductive  
6 material;

7           wherein the second region is located between the first region and the  
8 second region;

9           wherein third region is located between the first region and the third  
10 region; and,

11          wherein the first region has a higher resistivity than the second region  
12 and than the third region.

1           11. A heating device as in claim 10 wherein:

2           the top layer comprises aluminum;

3           the middle layer comprises tantalum aluminum; and,

4           the bottom layer comprises WSi<sub>3</sub>N<sub>4</sub>.

1           12. A heating device as in claim 10 wherein the heating device is within a

2 total internal reflection switching element used in an optical cross-connection

3 switch.

1           13. A heating device as in claim 10 wherein the heating device is within  
2 an inkjet printhead.

1           14. A heating device within an integrated circuit, comprising:  
2 a first conductive lead;  
3 a second conductive lead;  
4 a third conductive lead;  
5 a fourth conductive lead;  
6 a first resistive region connected between the first conductive lead and the  
7 third conductive lead; and,  
8 a second resistive region connected between the second conductive lead  
9 and the fourth conductive lead;  
10 wherein a side formed by the first conductive lead, the first resistive  
11 region and the third conductive lead is parallel to a side formed by the second  
12 conductive lead, the second resistive region and the fourth conductive lead.

1           15. A heating device as in claim 14 wherein an insulator is placed  
2 between the side formed by first conductive lead, the first resistive region and  
3 the third conductive lead and the side formed by the second conductive lead, the  
4 second resistive region and the fourth conductive lead.

1           16. A heating device as in claim 14:

2            wherein a third resistive region is placed between the first resistive  
3 region and the second resistive region; and,  
4            wherein resistivity of the third resistive region is higher than resistivity  
5 of the first resistive region and of the second resistive region.

1            17. A heating device as in claim 14 wherein the heating device is within a  
2 total internal reflection switching element used in an optical cross-connection  
3 switch.

1            18. A heating device as in claim 14 wherein the heating device is within  
2 an inkjet printhead.

1            19. A heating device as in claim 14 wherein the heating device is placed  
2 on a structure that defines a bore hole exit for an inkjet printhead.

1            20. A heating device as in claim 14 wherein the heating device is  
2 arranged as part of a tube design for an inkjet printhead.